

Case report

Longitudinal cleavage of the penis in chronic spinal cord injury: two case reports

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Context: Penile cleavage is a rare complication of spinal cord injury (SCI) in patients with a chronic indwelling catheter. We report two cases of chronic SCI who developed penile urethral cleavage after prolonged use of an indwelling catheter for bladder management.

Findings: A 25-year-old wheelchair mobile male with T7 American Spinal Injury Association (ASIA) Impairment Scale (AIS) grade A paraplegia developed a 4 × 1.5 cm ventral urethral cleavage after using an indwelling catheter for four months with inadequate care. He had an associated urinary tract infection and undiagnosed diabetes mellitus. A suprapubic catheter was inserted and surgical repair recommended after resolution of UTI and adequate control of his diabetes mellitus. After initial treatment he was lost to follow-up.

The second patient was a 15-year-old male with AIS grade B tetraplegia who presented with a 2.5 cm cleavage on the ventral aspect of penis for the preceding three months. He had been using an indwelling catheter for bladder management for the previous 18 months. He had modified Ashworth scale grade III spasticity in lower limbs resistant to conservative management. There was no history of trauma, infection or diabetes mellitus. The patient was advised penile urethral repair surgery but was lost to follow-up.

Conclusion: Penile cleavage is a rare complication of neurogenic bladder in SCI patients. Patients and care givers should be trained in proper bladder management techniques during the hospital stay, counseled regarding the need for regular follow up, and be taught identification and prevention of common complications.

Keywords: Spinal cord injury, Tetraplegia, Paraplegia, Neurogenic bladder, Urinary catheterization, Penile cleavage, Urinary bladder, Complications

Introduction

Urological management is a vital component of the care necessary to optimise patient outcomes following spinal cord injury (SCI). The preferred option is clean intermittent self-catheterization (CISC) with at least annual follow-up evaluations. Other options for bladder management include reflex voiding, indwelling catheter (IDC), condom drainage, and suprapubic catheter (SPC).¹ Each option has its own advantages and potential complications.² The factors influencing bladder management include: the level and grade of injury, vision, hand and upper limb functioning, cognition, psychological and emotional state, urodynamic evaluation, age, available resources, and patient's preference and life expectancy.^{3,4} Penile cleavage and erosions are rare complication arising from indwelling catheters.

Only a few cases have been reported in people with chronic neurological conditions, including SCI,^{5,6} and residents in nursing homes.^{7,8} We report two cases of longitudinal penile cleavage in chronic SCI patients with long term IDC.

Case reports

Case Number 1

A 25-year-old male with a T7 traumatic SCI, American Spinal Injury Association (ASIA) Impairment Scale (AIS) grade A, of 18 months duration reported to the outpatient department with penile erosion and urinary leakage following use of an IDC for the previous four months. Prior to that he was successfully managing his bladder by 4 hourly CISC. He had detrusor over-activity on an earlier urodynamic evaluation.

The penile erosion started four months previously when he developed acute urinary retention. He reported to the local hospital and an IDC was placed as an

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emergency procedure. He subsequently continued to use an IDC for bladder management as this gave him better comfort and personal preference. After few days of IDC insertion, he noticed that skin on the volar aspect of his glans penis was eroding. He did not seek medical advice because of lack of transport and considering it a minor complication. When the erosion turned into gross cleavage and the urinary leakage increased, he decided to seek expert medical opinion. The IDC had been changed only once in four months after insertion at his home by a local nurse.

On examination he was an average build, wheelchair mobile young male. He had an IDC in situ, coming out from the root of the penile shaft, and the whole ventral surface of the penile shaft was eroded (Figure 1). The penile skin was intact near the glans. Laboratory investigations including CBC, erythrocyte sedimentation rate, liver function tests, renal function tests and ultrasound of kidney and bladder were normal. The fasting and random blood glucose levels were 140 mg/dl and 230 mg/dl respectively. The glycosylated hemoglobin was also elevated (7.8%, normal range 4%–6%). Urine routine examination revealed high glucose and numerous pus cells. The urine culture grew *Escherichia coli* sensitive to Nitrofurantoin.

The patient was managed with oral metformin 500 mg twice daily for diabetes and Nitrofurantoin 100 mg twice daily for the urinary tract infection. He was advised dietary control for diabetes and plenty of oral fluids. He was reviewed by an urologist and a SPC was inserted. Repair and reconstruction was delayed till normalization of blood glucose and control of infection. The patient urine became sterile after 10 days of treatment but the patient was unwilling to undergo immediate surgery and requested time to



Figure 1 Penile urethral cleavage on ventral side.



Figure 2 Intact penile urethra distally with skin erosion.

reach a decision to be discharged. He was lost to follow up.

Case Number 2

A 15-year-old male sustained a C6 AIS grade B SCI 18 months earlier in a diving accident. On reporting to our department he had a modified Ashworth scale grade III spasticity in lower limbs and was wheelchair mobile. He had an IDC for bladder management since his SCI. His spasticity was resistant to conservative management and he was non-compliant with management options due to poor adjustment to his disability. He noticed cleavage on the ventral aspect of penis three months prior to presentation. He ignored it initially, considering it of trivial nature. On examination he had a 3 cm cleavage on the ventral aspect of penis (Figure 2). There was no history of trauma, infection or diabetes mellitus. He was recommended surgical repair but has declined consent to-date.

Discussion

SCI management and rehabilitation services are poorly developed in low resourced countries, including Pakistan.⁹ Patients are not offered comprehensive SCI rehabilitation services for many reasons, including financial constraints; lack of physiatrists and specialist nursing and allied health staff; very limited availability of these services; delayed referral; and patient's personal preferences to find a cure rather than focus on functional improvement etc. At present there is only one dedicated SCI Rehabilitation unit in Pakistan offering integrated and comprehensive rehabilitation services to the SCI patients.¹⁰ Bladder management in SCI is particularly challenging in the developing countries due to poor knowledge, lack of rehabilitation centers, low literacy rate; poor socio-economic condition and perceived

ease of using IDC for patients and care givers. Most patients return to their native rural areas after discharge and are lost to follow up. There are usually no urological, SCI or rehabilitation services available in these areas and patients have to rely on local health care providers, including dispensers and male nurses running small nursing homes. Even if people with SCI do seek advice from a general practitioner, they are usually not aware to appropriate bladder management protocols for people with SCI and the need for a urological consultation. This leaves a vacuum which is then filled by “quacks” and untrained health care providers.¹¹

The aim of managing bladder dysfunction in SCI patients is to prevent urinary tract complications and develop a plan to facilitate a patient reintegrate into the society.¹ The preferred method for bladder management in SCI is CISC. However, depending upon the neurological level of injury, available social support and patients’ preference, other modes, may be adopted. These include IDC, SPC and credes maneuver.^{3,12}

Many patients with SCI choose IDC over CISC owing to difficulty in performing CISC or incontinence between catheterizations.¹³ Reported complications from IDC include allergic reactions, urinary tract infections, bladder calculi, cancer, epididymitis-orchitis, erosions and urethro-cutaneous fistulas. Iatrogenic hypospadias or penile shaft cleavage are rare and caused by traction on indwelling catheters.¹⁴ Comorbidities that impair immunity or healing, such as diabetes mellitus, alcohol excess, poor hygiene, UTI and improper catheter care may further exacerbate the cleavage.

Our first patient developed penile cleavage probably due to pressure of the catheter over the penile volar shaft along with undiagnosed diabetes mellitus, UTI and poor hygiene and care. The most probable cause in second patient was the severe untreated spasticity in lower limbs contributing to traction on the IDC.

Rathore *et al.* reported on a cohort of 187 patients who sustained traumatic SCI in the 2005 earthquake in Pakistan. Among those who were not primarily under a specialized physiatrists care, six patients developed urethrostomal fistula due to improper technique for CISC.¹⁵

There are a number of recommendations that we propose to help reduce the development and progression of a penile erosion or cleavage. Patients and their care-givers should be trained in IDC, including been given appropriate educational material. Adhering the IDC tubing to the upper thigh or abdomen so as to eliminate traction on the penis can prevent these complications. IDCs with a smaller size (12–14 F for men and 14–16

F for women)² and smaller (5–10 mL) self-retaining balloons are recommended to reduce the pressure effect on urethral surface and the bladder neck.¹² The IDC should preferably be changed every six to ten weeks. Lower limb spasticity can also contribute to the development of penile erosions or cleavage due to the bow-string effect of the catheter. Permanent ICD should be avoided where possible and alternatives such as CISC should ideally be initiated as soon as possible.¹⁶ Patients should be educated about keeping tension on catheter low, frequent skin checks, and recognizing the complications.

Treatment options include conservative management, with elimination of traction on the IDC and possible use of SPC and surgical repair with reconstruction. Although cleavage of the penis is not a life threatening condition, it can have a major impact on quality of life, mood, self-esteem and sexuality and it is preventable with relatively straight forward education and care

Conclusion

Penile cleavage is a rare complication of neurogenic bladder in patients with SCI. Although cleavage of the penis is not a life threatening condition, it can have a major impact on quality of life, mood, self-esteem and sexuality. It occurs in the setting of a long-term IDC and excessive and prolonged traction of the tubing on the glans of the penis in men who are insensate in this area. This complication is readily preventable. Patients and care givers should be trained and educated, including the use of appropriate diagrams, in the proper bladder management techniques during the hospital stay. They should be counseled regarding the need for regular follow-up, including IDC changes, and be taught about the identification and management of common complications.

Disclaimer statements

Contributors SNM collected the data from patient No 1, performed the literature search, wrote the initial manuscript. SBA collected the data from patient no 2, wrote the initial manuscript. FAR conceived the idea, performed the literature search, critically revised the manuscript and handled the submission process. PWN critically reviewed and revised the paper for intellectual content, language, grammar and syntax. All authors saw and approved the final version.

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Ethics approval This is a case series and we only asked for formal permission from the patients.

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